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THE QUESTION IS—

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MATERIALS AND FORMULAS FOR ONE TON 7-14-14

Materials	*1*	*2*	*3*	*4*	*5*	*6*	*7*
Ammo-Phos 11-48-0.....	585	585	585	585	585	520	585
Superphosphate 0-16-0....	...	...	...	...	...	200	...
Aero Cyanamid 22-0-0....	...	...	...	...	100	100	...
Nitrate of soda 16-0-0....	...	350	475	...	215	385	240
Sulphate of ammonia 20-0-0	100	100	...	380	100	...	100
Castor pomace 6-0-0.....	...	...	...	...	...	...	300
Nitrate of potash 12-0-44.	470	...	...	...	...	...	...
Muriate of potash 0-0-50..	150	560	510	560	560	560	560
Sulphate of potash magnesia	...	...	100	...	...	...	...
Dolomitic limestone.....	695	405	330	475	440	235	215
	2000	2000	2000	2000	2000	2000	2000
† Net basicity as $CaCO_3$	+365	+ 73	+144	−273	+130	+123	−161

† See Jour. Ind. Eng. Chem., Anal. Ed. Vol. 5, No. 4, p. 229, 1933

We would appreciate the assistance of experiment station workers in helping fertilizer mixers to answer this question. To this end we shall be glad to supply Ammo-Phos 11-48-0 for experimental purposes, and to send to those interested a copy of our "Handbook for Experiment Station Workers" in which this problem is discussed in greater detail.

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Sweet potatoes, like Irish potatoes, are a potash-loving crop. They need plenty of potash in fertilizer to produce big yields of the chunky No. 1's that bring the best prices. This has been proven by outstanding experiments, both in New Jersey and in Virginia.

At the Virginia Truck Experiment Station 13 different combinations of nitrogen, phosphoric acid, and potash were compared. As the potash in the fertilizer was increased, an increased average yield of prime sweet potatoes resulted: 3% potash fertilizer yielded 210 bushels per acre, 6% potash yielded 242 bushels, 9%—253 bushels, 12%—276 bushels and 15% potash yielded 289 bushels.

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GOOD NEWS
. . . for potato growers

POTATO GROWERS, searching for a bright spot in the present situation, will find that the biggest and best news in the new fertilizer price lists is the very small difference in cost between a low-potash fertilizer and a fertilizer well-balanced with plenty of potash. Potash is cheaper today than ever before in history. It is the cheapest unit of plant food the farmer can buy.*

For example compare 4-8-7 fertilizer with 4-8-10 fertilizer. The 4-8-10 contains 15% more actual plant food, yet it costs the farmer only a fraction more than the 4-8-7. Figured in terms of an acre the extra cost is so small it will surprise you.

This is good news because potash is the most important plant-food element in the production of good yields of a high-quality potato crop. Potatoes remove from the soil more potash than both nitrogen and phosphoric acid combined. If the fertilizer is not well-balanced with plenty of potash, potato plants have a tendency to make too much vine growth at the expense of the tubers.

Potash is the quality-producing element in potato fertilizer. It reduces the culls and produces No. 1 potatoes that are smooth, chunky and uniform—of better color and more even maturity. Potash-fed potatoes have a high-starch and low-protein content. When cooked, these potatoes are white, mealy and palatable.

The potato grower's best opportunity for success this season is to keep costs low and grades high. The extra yields and extra quality added at such low cost by extra potash are usually the most economical share of the crop. This is doubly true this year when potash is so cheap. POTASH PAYS!

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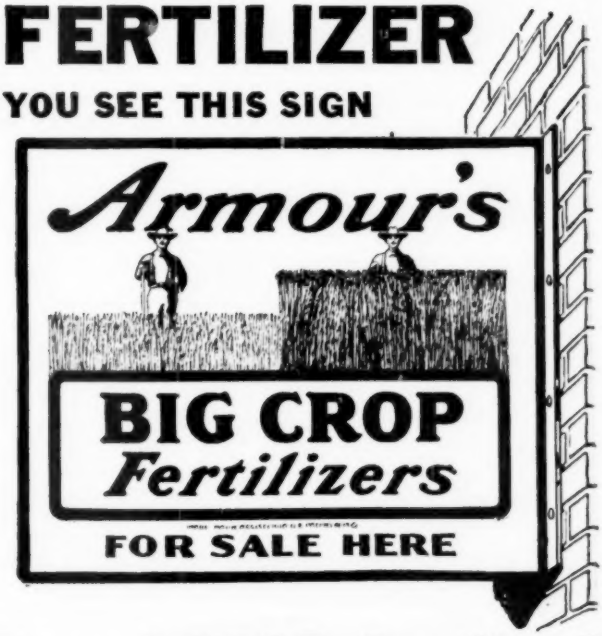

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CAREFUL PLANNING NECESSARY

As we plan for 1934 are we thinking only of the profits of last year? It is hardly possible that we can have forgotten 1932; a year when most potato growers were unable to pay their bills. Conditions looked but little better in the spring of 1933 but a short crop, resulting from unfavorable weather conditions, brought far better prices than any one had anticipated. The early potato growing sections received prices which enabled many growers to pay bills of several years' standing. As a consequence, a feeling of optimism prevails among the potato growers. This is desirable but this feeling of optimism should not run away with good judgment. Present indications are that there will be a marked increase in potato acreage this year. The proposed increase in acreage, coupled with favorable growing conditions, will result in a total production that may be far in excess of normal demands.

Consumption of potatoes has decreased in recent years and we must realize also that conditions generally are not likely to be normal by this fall. These facts would indicate it to be a very serious mistake to greatly increase production in 1934. Efforts are being made in some sections to prevent this. Several quite different plans have been proposed. Some growers have suggested the possibility of accomplishing stabilization by placing the industry under the Agricultural Adjustment Act. This possibility is discussed by Porter R. Taylor in this issue of the JOURNAL. All of the suggested plans have merit but the indications are that if we are to stabilize the industry, we must do the job ourselves. We cannot do it by greatly increasing production. It is to every grower's advantage to refrain from increasing his acreage since speculation at this time is likely to result in ruinous prices.

American Potato Journal

Volume XI January, 1934 Number 1

PRESIDENTIAL ADDRESS[1]

J. R. LIVERMORE[2]

It was a happy choice that brought the 1933 annual meeting of the many scientific groups, affiliated with the American Association for the Advancement of Science, to Boston. In this trying year of lightning-like changes in the everyday business and agricultural life of 130,000,000 people it is comforting and rather restful to get back into New England. Merely being near the Atlantic Ocean tends to stabilize the whirligig a bit when one realizes that the ocean tides ebb and flow today as they have done for thousands of years and as they will continue to do long after you and I and our children's children have gone; there is a feeling of permanence, a feeling of continuity, a better understanding of the Master Scheme of things.

Here, among the many points of interest directly associated with the early history of the Republic, it is easier to understand why the New Englander is a conservative individualist. His is not the unyielding conservatism of mulishness, rather it is a cautious attitude which requires that change of any sort had best be brought about slowly. For more than 300 years as the country spread west and south and further west these people of New England, in daily contact with physical evidences of the lives of the pioneers, of their accomplishments, of the fulfillment of their plans for a great nation, have been and are today more appreciative of what rugged individualism has done for this country than many others might be.

Human nature does not change overnight. The people of the United States have always considered it their just right to disagree and to discuss honest disagreements on any national issue. A democracy must allow this freedom of the press and the spoken word else that government ceases to be democratic and becomes autocratic or dicta-

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[1] Published as paper No. 203 Department of Plant Breeding, Cornell University, Ithaca, N. Y. Presidential address delivered at the 20th annual meeting of the Potato Association of America, in session at Harvard University, Cambridge, Massachusetts, December 28-30, 1933.

[2] Assistant Professor of Plant Breeding.

131615

torial. It should not be considered unpatriotic to state one's opinion whether or not it be in agreement with the policy of the party in power. A two-party system of government fails utterly if there is to be no discussion of the other side of national issues, for government by the people is truly representative of the people only when public opinion is allowed to form without undue influence of one kind or another. It is contrary to American principles to stifle discussion of real differences of opinion.

Of course all of us who are patriotic citizens want the President and his aides to succeed in their program designed to bring the country back to a reasonable degree of prosperity. Each of us will do all that he conscientiously can to help in any way possible but the charge of treason should not be made against those who discuss these plans for recovery. No real truth is ever harmed by a thorough discussion from all angles, rather it is the more firmly established by widespread argument based on facts.

In session as we are, as representatives of a goodly proportion of the potato growers of America, it would seem advisable to ask ourselves some questions concerning the Agricultural Adjustment Administration before our industry enters into any agreement with that Administration. We would be criticized by our members, and rightly so, if we did not make a serious attempt to analyze the facts and interpret them to the best of our knowledge in order that the potato farmer may decide for himself what he wishes to do when asked to sign the Agricultural Adjustment Administration agreement.

It sometimes happens that the disciples of a new doctrine in their zeal become overly enthusiastic; they are prone to disregard the accumulated wisdom of the ages resulting from the combined experience of many generations of different peoples under differing conditions. These fervent advocates of a new doctrine argue that the old human relationships have become obsolete; that the long-established economic laws no longer hold true; in short, they are soon convinced that a new era has arrived, everything is to be different.

Have we ever felt that we were in a new era before? Yes, many, many times. Just within the past fifteen years there have been several minor new eras and one major new era. So before we should all agree that we are on the threshold of another new era might it not be well to stop and consider? It is possible that we may be mistaken, we have been mistaken before. In 1928-29 many of us thought we were in a new era, everybody was to be rich; no more poor relief; no more bread lines; everyone was to be prosperous. The price of stocks

zoomed to the stratosphere and then collapsed when it was realized that everyone cannot get something for nothing at the same time. Every one of those booms illustrates the same principle, namely, that the age-old economic laws that history has taught us to be sound and workable in human society are not to be pushed lightly aside by words. It is not possible to repeal economic laws. We may interfere with their operation for a short time but sooner or later the law reasserts itself and we find that our vision of a new era was but a rosy-hued dream after all.

In the publication of the National Potato Association, the Potato World (Vol. 2, No. 10, Oct. 1933), there is presented in its original form, a proposed national plan to help the potato grower. This plan has the approval of some of the Farm Bureau officials and growers of several of the Western States and is being considered by high Administration officials. The plan proposes that there shall be a system of licensing of processors, dealers, and cooperative associations of producers of potatoes. A portion of the funds necessary to operate the plan will be derived from the license fees. The issuance of tags at a nominal fee to each producer will provide additional income to defray the expense. No package of potatoes is to be shipped or sold without a tag attached. There is no point in my presenting the plan here in complete detail, my purpose is to discuss the principles involved in the proposed remedy for the potato growers' troubles.

Regulated marketing and curtailed production are to be the principal tools employed to increase the farmers' income. No mention is made of any attempt to cut down the spread between the consumer price and producer price, to my mind a very fertile field for those who wish to increase profits to the farmer. The plan is to control the movement so that just enough potatoes will reach the market to maintain a reasonable price to consumer and producer. The exact number of bushels to maintain this desirable equilibrium in every market in the United States at the same time is to be determined by a board of regional representatives and Administration officials. Each farmer in any one region will be instructed by his regional representative as to how many bushels he may ship, and when, and the proper number of tags will be issued to the grower to cover that shipment. The dealer, who is licensed, must, under penalty of the law, handle only those lots of potatoes which bear the official tag. It is hoped in this way to control the volume of potatoes moving to the market.

The limitation of the number of bushels of potatoes produced is the major project of the proposed plan to help the potato grower, in

other words, controlled production. The number of acres to be planted in any one year is to be decided by the same group of men who control the marketing program. As weather is by far the most important factor in determining the yield of potatoes there will have to be considerable allowance for safety in order that there shall not be a shortage of potatoes. In 1933 the delay of killing frost for two or three weeks increased the crop 5,000,000 bushels in two states alone and five or six weeks of dry weather cut the expected national crop 60,000,000 bushels; it would seem advisable to have a few weather prophets on the potato board.

The purpose of controlled production is to bring more money to the farmer; it must follow that the price to the consumer shall be raised. Has any one ever tried to raise prices by curtailing production and if so what happened? Yes, there have been at least five attempts to do this very thing so recently as within the past twenty-five years and the story is the same for all of them. The endeavor to raise prices by controlled production results in a temporary increase in price, soon followed by decreasing demand; increasing utilization of substitutes; and the bringing into production of new sources of supply. The end result of these several factors is a greater surplus than before; collapse of the artificial barrier; renewed operation of the law of supply and demand and the producer is worse off than he was before.

There is nothing in any of the plans proposing curtailment of production which would indicate that the Administration has any intention of removing the marginal farmer, the marginal hog, the marginal cow or the marginal land from production. So far, all reduction of productive capacity and destruction of wealth has been on a pro-rata basis. The good sow went with the poor ones; the good dairy must reduce as does the poor one; the good acres of rich, black, cotton land must be held out of production as are the poor, sorry acres of thin yellow soil.

The same scheme is to be followed in the potato plan; the producer of low yields per acre of poor quality potatoes must cut his production the same proportionate amount as the farmer who is situated on good potato soil producing a high percentage of fine quality potatoes. Economically, the logical procedure would be to remove from production the marginal producing unit whether it be farmer, hog, cow or land but apparently that is not to be done. It is utterly ridiculous to cut down such excellent potato areas as Long Island, New York; Aroostook County, Maine; the Twin Falls and Idaho Falls section in

Idaho and similar areas in any other state that always produce high quality potatoes.

The consumer will not buy more potatoes if we continue to deliver to him so many carloads of potatoes that are unfit for human consumption so why not take out of production the land that produces poor quality potatoes. Yes, I am for that portion of the proposed marketing plan that calls for quality, to ship only quality produce. That is a decided step forward. That is why I say that if it is necessary to curtail production then most certainly the cut in acreage should *not* be made in the quality areas but should be in the marginal areas.

If the proposed regulation of supply goes into effect can we assume that per capita demand will remain constant? You and I have lived long enough to see the potato demand shrink from 3.8 bushels to 2.5 bushels per capita. What might the result be if curtailed production raised the price to the consumer? The chances are he would eat more potato substitutes. The potato market right now is such that nothing should be done that would alienate the public, rather everything should be done to tempt the public to buy more potatoes.

It seems to me that the important factor of the pair, supply and demand, is *demand*. Every agency should be coordinated in a unified attack upon the consumer to stimulate within him a desire to eat more potatoes. The first line of this attack should be quality, external and internal. Not only should the potatoes be made more attractive in order to appeal to the eye but they should be of such quality that they appeal to the palate creating a desire for more.

The second line in this general attack is an educational effort to beat down the sales resistance developed against the potato by dietary propaganda. The faddists who proposed diets to reduce weight usually ruled out the potato in the first mouthful. Though such propaganda is not based on fact nevertheless there are many people who will refuse a healthful baked potato for fear that it will produce fat and then eat a chocolate eclair or a piece of cake or consume half a pound of chocolates in a day. We must organize our educational attack in such a way as to convince the consumer that potatoes are not necessarily fattening and that they do constitute an essential portion of a normal diet.

People in the United States will eat about so much food. In prosperity or in depression the total amount of food consumed will not vary a great deal but the kind of food does vary and varies continuously. So it happens that when the people are eating more oranges they will eat less apples, eating more rice eat less macaroni, more bread

or rice less potatoes, and so on. Every food competes with every other food; an increase in consumption of one decreases the consumption of another, so that if the increase in a certain food helps one group of farmers the decrease in the other food must harm an equal group of farmers. Incidentally the competing foodstuffs serve to illustrate the fact that in this complex civilization of ours there are few if any simple relations. It is far from the truth to assume that the change in one thing is the sole cause of a change in another. To assume that a favorable change in one commodity will not be offset by an unfavorable change in another commodity or that a change favorable to one group of people will not be largely counter-balanced by a change unfavorable to another group is fallacious.

The next line in the general attack is advertising. There is no question but that the changes in the food habits of the nation have been brought about through advertising. Be it true or false or merely misleading, advertising exerts a tremendous influence on the mind of the public in determining what they shall buy. Unfortunately advertising is expensive. It will be necessary to have the help of every potato grower to accomplish anything approaching success. The potato industry, scattered, as it is over the country, does not lend itself to unified action but advertise we must if we are to get the public back into the habit of buying potatoes.

If we set in order our own house perhaps the government will not find it necessary to do it for us. What can be done to increase the return to the producer? The first bit of self-help is to produce better potatoes more cheaply. Certified seed of the right variety planted on the best potato soils properly fertilized, and raised with intelligent cultural practices from planting to the storage bin will help materially in reducing production costs. Appearance is affected by soil and cultural practice, rest assured that more potatoes will not be sold until we improve their appearance when offered for sale. The trade demands different tuber qualities for different purposes; choose the variety and soil type that will produce the right quality for your particular trade. It will be necessary to carry on an educational campaign of facts to counteract the present-day erroneous ideas concerning the potato as food. Supplying the markets with quality produce only, will help, but extensive advertising will be necessary to increase demand materially.

Do not be concerned about over-production, there is no such thing as an oversupply so long as there are human beings who are in need of food and clothing; there is maldistribution and underconsumption,

yes, but not overproduction. Political economy and economic planning in general have failed to keep pace with scientific research and the resultant advance in the art of production.

It would be futile to advocate measures for relief that would serve only to increase the total production of any crop. The point of the whole matter is that in order to increase the farmer's income the cost of production of a crop unit must be reduced and increasing the yield per acre, by using better seed and better cultural practices, is the most logical way to bring this about. It is not for us, then, to wait till the demand catches up with the supply, rather we should prosecute the more vigorously all phases of research to the end that higher and ever higher levels of production may be attained at lower costs of man-labor and money.

THE AGRICULTURAL ADJUSTMENT ACT AND THE POTATO INDUSTRY

PORTER R. TAYLOR

The Agricultural Adjustment Act which became effective May 12, 1933, was specifically intended to restore the pre-war purchasing power of producers. In order to accomplish this purpose two general methods were provided. Seven basic commodities are listed in the Act, including wheat, cotton, corn, hogs, rice, tobacco and milk and its products. Provisions are included by which producers of these basic commodities may agree to reduce production of such commodities by agreement with the Secretary of Agriculture. In return for such reductions benefit payments are authorized to be financed from processing taxes levied on the commodity in question. As mentioned previously, such arrangements, however, are limited to the seven basic commodities named in the Act.

The Secretary of Agriculture is also authorized to enter into marketing agreements with "Processors, associations of producers, and other handlers of agricultural products" by Paragraph 2 of Section 8 of the Adjustment Act. This section further provides that such agreements shall not be in violation of the anti trust laws. These agreements are not limited to any specific commodities and thus provide the machinery in the Act for the handling of the problems of the commodities which are not included as basic commodities. It should also be pointed out that this section authorizes marketing agreements and not production agreements, as many believe. Thus the fruit and vegetable industries are in position to enter into marketing agreements

although no workable method for production or acreage control has been developed under the authority of the Adjustment Act.

Even more important than the authorization of marketing agreements is the authority to issue licenses which is granted to the Secretary of Agriculture by Paragraph 3 of Section 8 of the Act. In operation, this provision makes it possible for the Secretary to license nonsigners of marketing agreements under a license which is practically identical with the provisions of the marketing agreement signed by a substantial majority of the industry in question. This is particularly important because in previous years voluntary agreements have been defeated by a small minority, even though the overwhelming majority of the industry might support a plan.

With the initial operation of the Agricultural Adjustment Administration a considerable number of marketing agreements were presented for consideration. Most of those were from the tree fruit industries of the Pacific Coast States. Agreements were developed, hearings were held, and final approval given as rapidly as possible. While the number of agreements which have been placed in operation has not been large, it must be recognized that this entire development has been made since July 1. Later agreements are being completed at a very much faster rate and in a shorter period of time.

As mentioned previously, the initial agreements largely came from the Pacific Coast States because these areas had been faced with serious problems caused by over-expansion and reduced buying power. Among the agreements which have been approved were those dealing with California canned peaches, California deciduous tree fruits, Northwest tree fruits, California Tokay grapes, Pacific Coast walnuts, California canned olives and three citrus agreements including the industry in California, Florida and Texas.

The canned peach agreement was a distinct success and increased returns to producers from an average of about $6.50 per ton in 1932 to about $20.00 in 1933. This agreement included the limitation of the total pack, the allocation of this pack to individual canneries, the payment of a fixed price to producers and also the setting of resale prices on the canned product. The results to producers have been satisfactory and a recent advance in the price of the canned product indicates that the market situation is sufficiently healthy to justify higher prices than were included in the original agreement. Under the provisions of the agreement, one fourth of the increase in prices is to be allocated to a fund for payment to producers as the price paid

to the producer for peaches is approximately 25% of the value of the canned product.

The agreements covering fresh fruits have largely been built upon the principle of proration of shipments. It has long been recognized that the shipment of quantities of perishable products in excess of market consumption has reduced the price in the markets to a much greater extent than the increase in supply might justify. Voluntary efforts have been made from time to time to control shipments and thereby prevent disastrously low prices to producers. Such voluntary agreements, however, have rather consistently failed because of the unwillingness of a small portion of each industry to cooperate. In many instances such a small minority have found it much more profitable to increase the proportion which it would ordinarily ship and thus secure a very real advantage from the improved market conditions created by the sacrifice of the majority.

In addition to the principle of proration of shipments the fresh fruit agreements have included provisions for controlling the quantity shipped to auction markets and for the setting of minimum prices although the price making power has been carefully guarded to prevent the continuance of prices which would stagnate the movement of the product to market. It may be stated that all of the fresh fruit agreements have been reasonably successful during 1933, although the deciduous tree fruit agreement was not placed in operation. In this case nature had solved the problem through an excessive heat wave which reduced the supply available for market to such an extent that it was not necessary to operate the agreement.

In the case of the walnut agreement a portion of the total production and carryover was deemed to be surplus and was placed in the hands of the Control Committee for disposal by export, shelling, or otherwise, growers being compensated adequately for the portion which was diverted for this purpose. While the entire marketing period has not expired, present indications are that the prompt removal of the surplus has resulted in substantially higher prices to producers than would otherwise have been secured. Exports have been ten times those of recent years. It is also interesting to note that this agreement was signed by 100% of the industry so that all parties concerned are cooperating fully.

The three citrus agreements have been placed in operation during the latter part of December. This program includes three separate agreements for California and Arizona combined, Florida, and Texas, with a further agreement expected to be developed in Porto Rico. In

the form of operation they are quite similar to the fruit and vegetable agreements discussed previously. The important feature of the citrus agreements is a uniform section in each of the three agreements which authorizes the establishment of a National Stabilization Committee for oranges and a separate Stabilization Committee for grape fruit. These committees are also empowered to name a National Citrus Coordinator who presumably will act as their executive officer. The chief function of these committees will be the determination of the necessity for limitation of shipments from all citrus producing areas. When the committees deem shipments from all of the producing districts to be in excess of market requirements the committees have the power to limit total shipments from all states and to allocate the quantity to be shipped by each producing state as long as such a limitation of shipments is in effect.

As mentioned previously, the method of approach in the case of the basic commodities has been through voluntary agreements with producers for the reducton of acreage in the several commodities. Many interested in the potato business appear to misunderstand this situation with relation to potatoes. Potatoes are not listed as a basic commodity and it, therefore, has not been possible to develop a program specifically providing for the reduction of potato acreage. The acreage tendency in this respect has been in the opposite direction. It is quite possible that the acreage planted to potatoes in 1934 may be increased as a result of the acreage reduction programs in the other commodities. While the contracts signed by individual producers of basic commodities require that land rented by the Secretary of Agriculture shall be withdrawn from the production of all cash crops, it appears quite likely that producers may shift from the basic commodities in which acreage is regulated to commodities such as potatoes, in which the acreage is not under control.

It has been recognized for many years that the control of acreage is one of the most necessary steps in the maintenance of a satisfactory market for potatoes in order to prevent excessive planting in years following rather high prices. The drought and heat during the summer of 1933 reduced the production of potatoes and thus resulted in much higher prices, especially during the summer months when a real shortage of supplies was experienced. This increase in prices did not continue at as high a level as was anticipated so that prices paid to producers for late potatoes during the fall of 1933 have been quite close to normal.

On the basis of December, 1933, the so-called parity farm price

for potatoes in Maine would be 66 cents per bushel, 62 cents per bushel in Minnesota, 69 cents per bushel in Idaho and 96 cents per bushel in Virginia, with an average farm price for the United States of 82 cents per bushel.

It must be borne in mind that the situation outlined above is the one in effect at the present time and which will continue during 1934 unless amendments are made to the Agricultural Adjustment Act by Congress to change the present legal foundation. It has not been found possible to use marketing agreements for the purpose of limiting production, as the Act did not authorize the licensing of producers, although it does authorize the licensing of handlers and distributors in the "current of interstate or foreign commerce."

As has been mentioned previously a very large majority of the agreements which have been placed in operation during 1933 have related to tree fruit crops. While no agreements relating to potatoes have been placed in operation, several proposals have been submitted for consideration. First of these was a proposed marketing agreement for the Idaho potato industry developed along lines similar to the Northwest Tree Fruit Agreement. At the time this was submitted hearings were being conducted on a series of agreements, thus making it impossible to take prompt action on the Idaho agreement. For this reason the Idaho agreement was withdrawn.

A second proposal with reference to the 1934 season was submitted by the American Farm Bureau Federation at the request of the State Farm Bureaus in the western part of the country. This plan provided for the development of County Production Associations which would be coordinated into state units, and into a national organization headed by a National Potato Administrator. In addition to acreage control provisions along lines generally similar to those in operation in the case of the basic commodities, this plan provided for the control of the quantity forwarded to market. This control was to be made effective by the sale of tags to producers in each district at a fee sufficient to cover the estimated cost of operation of the proposed agreement. The quantity of tags issued would be determined in line with a definite program of movement of the crop to market. It was intended that every sack of potatoes would be required to carry such a tag for the marketing period in question. In this way it was proposed to regulate the movement to market both as to quantity and as to the time of shipment.

This proposed plan has many merits, especially as it is intended to correct the basic conditions of acreage and volume moved to market

which are important factors in price making. However, the complicated machinery provided by the plan would involve a tremendous amount of detail in operation and it would be exceedingly difficult to police in many producing districts or markets. It must be recognized that rail shipments of 200,000 cars include only about 120,000,000 bushels, or slightly more than one third of the production in the past year. Thus it is clearly evident that a very large volume of shipments are handled by truck or moved to market in a more or less direct way from producer to wholesaler, retailer, or consumer. All of these factors would make the operation of a tag plan such as is proposed exceedingly difficult.

A third proposal from the potato industry is now in process of development. At the annual meeting of the Interstate Early Potato Committee in October the development of a marketing agreement was authorized by the members of the shipper groups represented at the meeting. A committee was named to carry on this activity and the draft of an agreement is in process of formulation. This proposed plan contemplates control of shipments and also probably the establishment of minimum prices from day to day. As the agreement has not been submitted in definite form, it is not possible to discuss it in detail. However, as the proposed plan is intended to cover operations in sixteen early potato states it should prove to be a very important step in the early potato industry if it can be carried out along the lines suggested. The plan under consideration is sufficiently elastic so that it might be expanded to include late potatoes if it was desired to do so.

As has been indicated, the potato industry presents three distinct problems in connection with marketing agreements. The first of these is the development of a plan covering the early potato industry, and must be suitable for the marketing of a perishable commodity which moves to market immediately after harvest. In this respect it appears likely that the methods which have been used in other marketing agreements may be equally effective in the handling of the early crop. Because of the comparative'y small proportion of the total market supply which is represented by shipments from early producing areas it would appear doubtful whether the withholding of shipments from such producing districts would be desirable. It appears rather that the movement should be regulated so as to prevent either over or under supply in the markets at any particular time.

When the potato movement has reached the intermediate producing states these areas become the chief source of supply for the entire country as the crop of the previous season has practically disappeared

from the market. Under these conditions the situation is different from the early producing states. It is entirely possible that a supply in certain intermediate states, or all of them, may be in excess of actual consumer requirements. Any surplus shipped over such requirements necessarily will have a very marked influence upon the price level. Under such conditions it might be desirable to withhold a portion of a large crop in the intermediate states from shipment during its normal period of movement in order to maintain a higher price level for the balance of the crop, and thus produce a greater total net income to the farmer. Therefore, a proration plan of withholding shipments may be worthy of serious consideration. Because of the practicability of keeping potatoes in the intermediate states for a longer period of time than in the early states, it may prove feasible to use supplies which are withheld from shipment for sale in local markets.

The late crop presents two very different types of marketing problems. The first of these relates to the regular commercial shipping districts, where the industry is highly concentrated and where potatoes have become a major source of producer income. Among this group would be included Maine, the Red River Valley, Southern Idaho, Western Nebraska and certain areas in Colorado. In these districts potatoes are recognized as a leading cash crop and shipments to distant markets are the basis on which the industry has been built. A considerable degree of success may be achieved with a control of shipments to market from these areas which originate about two-thirds of the commercial rail shipments of late potatoes in the United States. Thus, if the shipping districts mentioned above could control the rate of movement of the crop to market this would largely solve the problem for the entire country during most of the year.

A rather frequent objection to such a procedure would doubtless be raised on the ground that no single shipping area should be expected to withhold shipments from market without the possibility of working to its own disadvantage and the advantage of competitive districts which do not follow a similar program. This same objection was raised in the case of the Northwest Fruit Agreement, and yet it is admitted by those who are familiar with its operation that it has been successful in increasing producer income substantially. Most important potato shipping districts must pay rather high freight rates to market and therefore would benefit directly from a program which would raise the price level in the markets. It obviously would be much more desirable and effective if all of the important shipping states would cooperate fully in a program of this type with central coordination of

shipments. In the past there have been frequent efforts of this character, but there has always been difficulty in securing the full cooperation of all districts. Such a plan might be developed and operated effectively along the line of the National Committees outlined above in the citrus agreements.

Those producing areas which are relatively close to large consuming markets and in which truck shipments have become much more important in recent years present peculiar difficulties in any program under a marketing agreement. New York, Pennsylvania, Ohio, Michigan, and Wisconsin might be included in this group. Such shipping areas have the advantage of nearness to market and low transportation costs. They have the further advantage of being able to deal directly with wholesalers and retailers and so eliminate some steps in the normal marketing channels. In addition, it is much easier to market second grade stock from nearby producing areas because the transportation charges are usually not as great as those from more distant points, and a greater portion of the market price may be returned to the producer. On the other hand, such producers frequently have the disadvantage of higher operating expenses, such as for labor, and other items which may or may not require greater expenditure, such as interest on capital investment, taxes, etc.

The development and operation of marketing agreements in states which produce large quantities of potatoes for local consumption offer numerous difficulties. Among these are the large number of handlers and shippers who would be required to sign the agreement, the difficulty of restricting operations in areas where truck movement is the most common form of transportation and where sales are made direct to wholesalers or retailers by producers. In addition, the problem of policing such agreements would be extremely difficult because of the wide-spread character of distribution in areas of this kind.

From the above discussion it would seem clear that marketing agreements along the lines which have been developed up to the present time offer a considerable chance for success in the early potato producing states and in the important late shipping districts which are a considerable distance from market. It does not appear likely that agreements may be expected to be generally successful in those areas where production is for local consumption purposes.

But while marketing agreements may not prove to be practical in areas where local markets are available, such producing districts will doubtless benefit from any improvement in the general price level which might result from agreements in the shipping states. If properly ad-

ministered such agreements should not give nearby areas any abnormal advantage, but all producers should benefit from any improvement in the general price level established in the major markets.

It is our belief that a series of agreements including the early shipping districts and the important late commercial districts might be coordinated under a plan similar to that which is being put in effect in the citrus industry. While it may appear that results cannot be secured without the full cooperation of all producing areas, it must be borne in mind that the important late producing states supply by far the largest proportion of the rail shipments and, therefore, a control of shipments from such districts would serve as a control on most of the supply moved to market.

My own personal contact with the marketing of potatoes from producing districts has extended for well over a decade. In addition, I have had an opportunity to observe the product which is offered to the consumer in a number of different consuming centers. From the standpoint of the actual consumer it is frequently impossible to purchase potatoes which are of satisfactory quality. This fact has also been developed in a number of surveys.

Crop estimates furnished by growers covering four recent years indicate that on the average only about two-thirds of the total production will grade as U. S. No. 1. I believe it can be stated without possibility of refutation or contradiction that any surplus of production over demand can be entirely controlled by strict adherence to the U. S. No. 1 grade except in years of excessive production. Thus, in most years the tightening up of grade provisions to a strict U. S. No. 1 basis would probably eliminate any depressing surplus from the market. This would not injure the average producer and would probably work to his actual financial benefit. In years of heavy production it doubtless might be necessary to hold back a considerable portion of the U. S. No. 1 stock from the market in order to maintain a remunerative price to the producer. In either instance such a program could be carried out through the medium of marketing agreements in the important producing areas with central coordination of some form.

One of the other marketing problems of the potato industry has been the alternate periods of heavy and light shipment. It is generally recognized that such heavy shipments are followed by weak markets with resulting accumulations of supplies in the terminal centers. These unsold supplies continue until the quantity of shipments decreases to a sufficient extent so as to permit the market accumulations to be absorbed. When such accumulations have been absorbed the market

usually strengthens and thus induces heavier shipments for a second time. This cycle is continued so that the market is usually in a condition of over-supply because of shipments enroute to market or stocks on track in central markets.

Through the medium of marketing agreements such situations might be very definitely controlled in each of the producing areas. These would operate on the basis of limitation of the quantity which might be shipped. While action of this character would be initiated voluntarily by the shippers who had signed such an agreement, the entire industry in a particular district would be under license and, therefore, would be required to adhere in the program. In connection with the stricter grading and control of shipments no individual shipper would be discriminated against, as the same rules would apply to all of those within the district. Through this method condititons might be improved very generally without working a hardship on any individuals.

From the acreage standpoint the prospect for 1934 is not particularly favorable. "Intentions to plant" figures indicate an expansion of about 20% in acreage in the early and intermediate states, a considerable portion of which is legitimate due to the smaller late crop carried over from 1933. It is also possible that the acreage in the late producing states may be increased somewhat because of the rather favorable 1933 prices and the expected tendency to shift acreage from basic commodities.

Unless there is a large increase in potato production it should be possible to satisfactorily handle the market situation through marketing agreements in the important shipping areas of the country. Because of their flexibility, such agreements should prove effective in meeting any probable overproduction, as a strict adherence to the U. S. No. 1 grade will result in a substantial reduction of the volume actually shipped.

If a coordinated program of such marketing agreements providing for control of grade and shipment to market can be placed in operation in the important shipping areas, it should achieve the purpose of the Adjustment Act for the potato grower, which is the establishment and maintenance of a parity price.

INFLUENCE OF THE LEVEL OF FERTILITY ON THE OPTIMUM SPACING FOR POTATOES

P. H. WESSELS

If there is any general rule for the spacing of plants for maximum crop production it is that spacing depends on the variety of the plant and the fertility of the soil. Thompson in his book "Vegetable Crops," in writing of beans, says: "The spacing of the rows and of the seeds in the row should be determined by the type or variety, the richness of the soil and the amount of moisture. Large growing plants should be given more space than small plants and on rich soil more space is needed than on poor soil, provided the rainfall is sufficient, or irrigation is practiced." Similar statements are made in discussing the growing of asparagus, cauliflower, corn, cucumbers, squash and tomatoes. The same rule might be expected to hold for potatoes although the common practice seems to favor closer planting on the more fertile fields. In writing about potatoes, Hardenburg states: "In regions where mineral nutrients and moisture are likely to be limited, wider spacing of the plants and less seed per acre are recommended." This statement is in line with Thompson's observation on beans: "In dry farming more space is given than under irrigation or in humid regions."

The present tendency among potato growers on Long Island is to practice closer spacing and to use more seed per acre. A few years ago fifteen inches between hills was the standard practice for late potatoes; today more and more of these growers are spacing the hills thirteen inches or less. In response to their interest in this matter of spacing, a test was conducted at the Long Island Vegetable Research Farm in 1932. In presenting these results it is recognized that the results from a single test are not conclusive and that the optimum spacing for the maximum production of marketable tubers may very well depend on the variety of potato, the type of soil, the fertility of the land, the amount of moisture or on some local factor that limits the application of these results. However it was thought that a report of the results obtained in this test might be of interest to the members of the Potato Association of America because this spacing test was conducted in connection with a fertilizer experiment and thus affords some information on the influence of the level of fertility on the spacing for maximum crop production.

It is obvious that if we are to discuss the effect of fertility on the optimum spacing for crop production we must have some measure of fertility. If only a single fertilizer element were involved we might

arrange the yields according to the quantities of this element that were applied. Where there are several fertilizer elements involved and the quantities of each are varied, no such simple arrangement of yields is possible. For the purposes of this paper it has been considered that the relative fertility of the various plots is indicated by the total yields of potatoes produced by the various fertilizer treatments. This is an arbitrary definition and open to some objection. The total plant growth might be a fairer indication of the relative fertility of the plots since tuber production is not necessarily parallel with plant growth.

This trial was conducted on a level field of Sassafras silt loam soil underlaid with sand and gravel at a depth of about three feet. There are eighty-eight plots, each twenty feet wide by forty-eight and one-half feet long. These plots are arranged in four tiers of twenty-two plots each with aisles four feet wide separating the plots on all sides. The aisles are planted and are given the same cultural care as the plots but receive no fertilizer. Every third plot is a check plot. These thirty-two check plots receive fertilizer at a rate equivalent to one ton of a 2.5-5.75-3.0 mixture per acre. Five of the plots receive no fertilizer. There are seventeen other fertilizer treatments with three plots for each. The rates of application for the various fertilizer elements are: nitrogen: none, 25, 50 and 75 pounds per acre; phosphorus: none, 58.5, 115 and 172.5 pounds P_2O_5 per acre; potash: none, 30, 60 and 90 pounds K_2O per acre. Stable manure is used at rates of 10, 20 and 40 tons per acre and these applications are also supplemented with phosphoric acid at the rate of 115 pounds per acre and, in the case of the 10 and 20 tons of manure, with complete fertilizer mixture in the same quantity as applied to the check plots. The fertilizer treatment for any given plot has been the same every year since 1923 so there has been ample opportunity for differences in fertility to have become established.

The Green Mountain variety of potato was used in this test. The seed pieces averaged approximately one ounce each. The planting was done by hand; the rows were spaced thirty-two inches apart. Accurate spacing of the hills in the rows was assured through the use of wire planting-lines with drops of solder spaced 9, 11, 13 and 15 inches. The quantity of seed used was 22.7, 18.5, 15.6 and 13.6 bushels per acre. There were two rows of each spacing on each plot. The sorting into marketable sized tubers was done over a mechanical grader with circular openings one and seven-eighth inches in diameter.

The results obtained are given in the table. The yields have been calculated to bushels per acre. The upper figure in each case is the

TABLE 1.—*Effect of Spacing on Yield of Potatoes*

Fertilizer treatment, quantity per acre				Spacing of hills in row			
Nitrogen lbs.	P_2O_5 lbs.	K_2O lbs.	Manure tons	9″	11″	13″	15″
0	0	0	0	158.7*	141.5	135.2	133.2
				77.9	79.2	76.0	84.8
0	115	60	0	192.9	177.1	173.2	153.4
				110.8	118.0	112.7	105.7
25	115	60	0	186.9	201.4	197.8	183.8
				110.9	143.5	129.4	127.7
50	115	60	0	224.6	222.7	202.7	198.3
				140.4	153.5	135.5	144.0
75	115	60	0	209.7	204.1	188.8	182.8
				120.4	137.1	113.8	126.0
50	0	60	0	168.7	165.6	138.2	129.8
				75.3	87.6	68.9	74.1
50	57.5	60	0	207.6	202.5	225.5	183.8
				116.7	135.0	121.7	130.0
50	172.5	60	0	232.2	224.1	208.8	197.3
				148.4	159.7	144.8	153.0
50	115	0	0	144.3	143.8	127.6	131.0
				61.2	66.8	54.3	62.3
50	115	30	0	187.2	192.9	175.2	163.1
				100.1	117.2	96.9	107.2
50	115	90	0	228.6	228.8	201.9	201.5
				130.3	162.7	139.2	151.6
0	115	0	0	150.9	134.1	121.6	121.4
				77.4	74.4	64.0	66.6
0	115	0	10	223.3	207.9	205.2	187.8
				140.7	151.2	142.4	137.6
50	115	60	10	275.1	271.6	256.9	242.9
				190.6	208.3	193.2	190.1
0	0	0	20	248.0	244.6	211.4	206.1
				168.7	179.1	143.8	153.2
0	115	0	20	250.4	245.6	228.3	198.8
				174.8	193.1	168.8	152.5
50	115	60	20	291.2	273.0	270.1	251.0
				213.4	216.6	211.4	206.5
0	0	0	40	286.3	264.8	271.2	241.5
				195.3	202.6	207.3	185.8
0	115	0	40	298.5	272.2	255.0	251.4
				222.3	223.3	198.5	197.5

* The upper figure gives the total bushels per acre. The figure below gives the yield of marketable potatoes.

total yield; the figure directly under is the yield of tubers of marketable size. The figures under the heading "Fertilizer treatment" give the pounds of fertilizer elements and tons of manure applied per acre. The total yields ranged from 121 to 298 bushels per acre and the yields of marketable tubers ranged from 61 to 223 bushels per acre. The 9 inch spacing gave the greatest total yields in 14 of the 19 treatments; was second highest four times and third highest once. The 11 inch spacing gave the highest total yields with four of the treatments, was second highest with thirteen of the treatments and was third highest

twice. The 13 inch spacing gave the highest total yield only once, was second highest twice, third highest fifteen times and fourth highest once. The 15 inch spacing gave the lowest total yields with but one exception when it was next to the lowest.

The results with the yields of marketable potatoes are less consistent. The 9 inch spacing produced the largest yield of marketable potatoes only once; was second on six of the treatments; third on nine of the treatments and was fourth on three of the treatments. The 11 inch spacing produced the largest yields of marketable potatoes on sixteen of the nineteen treatments and was second on three of the treatments. The 13 inch spacing gave the largest yield in but one instance; was second four times; was third five times and gave the lowest yields on nine of the treatments. The 15 inch spacing produced the highest yield on but one treatment; was second highest six times; third highest five times and gave the lowest yields seven times.

If the results are examined from the standpoint of the quantities of the various fertilizer elements applied it is found that the 11 inch spacing gave the greatest yield of marketable potatoes regardless of the quantity of nitrogen applied. This is also true for various applications of phosphoric acid and of potash. It holds likewise for the 10 ton and the 20 ton applications of manure. The 13 inch spacing gave the largest yield on the plots that received manure at the rate of 40 tons per acre but when this quantity of manure was supplemented with phosphorus the 11 inch spacing proved most effective. There is little in the results obtained in this test to indicate that spacing should be increased as fertility is increased. If one were to draw conclusions from a single trial of this kind it would have to be said that under the conditions that existed the level of fertility, whether measured by crop yields or by fertilizer applications, did not influence the optimum spacing for the maximum production of marketable tubers.

THE ACTIVITIES OF THE INTERNATIONAL COMMISSION FOR THE STUDY OF THE POTATO

WM. STUART

In view of the fact that, so far as I am aware, no mention has been made of the organization of such a commission as is indicated in the title of this paper it seemed advisable to the writer to take this opportunity of discussing the aims and objectives of the commission. It also seems worth while to call attention to some of the results already accomplished.

The International Commission for the Study of the Potato was appointed during the Congress of the International Association of Plant Breeders which was held at Berlin in June, 1931. The commission as originally selected consisted of eleven members as follows:

V. Ducomet, Pres.	Grignon, France
H. von Rathlef, Sec'y.	Halle, Germany
S. M. Bukasov	Leningrad, U. S. S. R.
Karl Hammarlund	Sweden
Hugo Jelinek	Czecho-Slovakia
Victor Lathouwers	Belgium
Anatol Listowski	Debica, Poland
R. N. Salaman	Cambridge, England
Marius J. Sirks	Wageningen, Holland
Karl Snell	Berlin-Dahlem, Germany
W. Stuart	U. S. D. A., Washington, D. C.

Since this meeting Thos. P. McIntosh of Edinburg, Scotland, has been added to the Commission.

The chief objective of this group of workers is that of collecting data on all existant or non-existant varieties of potatoes in the world that have been introduced into cultivation. Anyone who has attempted to assemble all available information on potato varieties of American origin can readily under tand the immensity of the task undertaken by the Commission and the question might well be asked whether such an array of information is of sufficient importance to justify the effort. To this I would reply that if the mere collection of information was the sole object of the Commisssion the effort is not justified. Those instrumental in the setting up of a facts-finding commission had a much broader and more far-reaching field of activity in mind. While the immediate work of the Commission has been that of the assembling, classification and recording of all available data on the world's potato varieties its ultimate aim is the creation of a card index catalogue, embracing all known facts concerning the potato varieties of the world, to be kept at some central point by an active and well-informed secretary. This will ensure a reliable source of information to all who are interested in the improvement of the potato. Furthermore it is proposed to encourage a study of the genetic inheritance or composition of as many varieties, especially of representative families or groups as may be possible, with the end in view of securing information in regard to disease resistance or disease inheritance factors, heat, drought, or cold resistance, regional adaptation, length of day responses, vigor, productivity, tuber shape, table quality, etc.

It may interest you to know that our enthusiastic and hard-working secretary has already published a report on the potato families, or branches, of the varieties of the world and their seedling progenies.

In this publication comprising 134 pages of text Dr. von Rathlef presents the following group divisions of varieties. The first two groups are based on period of origin and region. For example the first division "A" is entitled the "Old English-North American Group," and the second "B" is labeled the "Old Continental-European Group."

Division "C" represents the more recent (younger) North American-English Group.

Division "D" has a more local aspect as it represents the "Daber Group."

The remaining varieties, that is, those not relegated to the four preceding groups, are included under the caption of *"Remaining short progeny series listed in alphabetical order."*

Varietal immunity or susceptibility to the wart disease when known is indicated by suitable abbreviations as are also those resistant to other diseases.

As might be expected where an individual attempts the classification of foreign varieties, without consulting those familiar with them there are some unnecessary errors in judgment. One of the most noticeable is that of the setting up of Carman No. 3 as a separate family or branch from that of the Rural New Yorker No. 2. Furthermore it would seem inadvisable to include, as has been done, a record of numerous seedling crosses involving some parent included in the family. In our opinion a classification should be based on named varieties or those to which definite numbers have been assigned and which have been tested sufficiently to indicate the desirability of their introduction.

It would seem that if the Commission is to function effectively, collective consideration of manuscripts dealing with classification, nomenclature, inheritance, and other factors must of necessity be adopted.

While it has not been possible to give as much time to the collection of inheritance factors or other data concerning American varieties I would like to urge upon you the desirability of calling our attention to anything that seems of interest to you concerning the behavior of varieties, whether it be with respect to character of soil, resistance to disease, insects, cold, heat, or drought. All such observations may have a definite value to the plant breeder as well as to the commercial potato grower. If you will take the trouble of communicating such information to me I will be glad to forward it to Dr. von Rathlef.

The following classification of the Old English-North American Group will serve to illustrate the scheme adopted by von Rathlef,

bearing in mind that the descendants of each variety are in turn given. In some cases 8 generations are listed.

A. Old English-North American Group.
Stem 1. Patersons Victoria
P-Generation.

1. Victoria. Paterson. Seedling of Fluke or White Rocks. (White Rocks krf.)

F_1-Generation.

Descendants of 1. Victoria. Paterson

1. Edelstein. Richter. Patersons Victoria x Early Rose. anf.
2. Imperator. Richter. Early Rose x Patersons Victoria. anf.
3. Juwel. Richter. Early Rose x Patersons Victoria. anf.
4. Early Regent. Fenn. Early Rose x Patersons Victoria. anf.
5. Magnum bonum. Clark. Early Rose x Patersons Victoria. anf.
   (a) Syn. Hammersmith.
   (b) Ebstorfer S. E. Z. III. St. A. of Magnum bonum.
6. Maincrop Kidney. Clark. Syn. Langworthy. Early Rose x Patersons Victoria.
7. Schoolmaster. Barr. Early Rose x Patersons Victoria. krf.
8. Schneerose. Richter. Early Rose x Patersons Victoria.
9. Fidelio. Richter. Patersons Blaue Niere x Patersons Victoria.
10. Ally—Arran Treasurer. McKelvie. Descendant of Patersons Victoria? krf.
11. Ninetyfold. Clark. Elefant x Victoria. anf.
12. Perfection. Clark. White Elephant x Victoria, Syn. President.
13. Supreme. Clark. White Elephant x Victoria. krf.
14. British Queen I. Findlay. Patersons Victoria x Seedling of Old Blue Don. anf.
15. Up-to-Date. Syn. Cummings Pride. Findlay. Patersons Victoria x Seedling of Blue Don. anf.
   (a) Field Marshal. Bud variation of Up-to-Date. anf.
   (b) Fin de Siecle. Bud variation of Up-to-Date.
16. Reading Hero. Clark. Magnum bonum x Victoria.
17. Bruce. Findlay. Late Rose x Victoria. anf.
18. Jeannie Deans. Findlay. Beauty of Hebron x Victoria. krf.

NOTE:—krf.—wart immunity; anf.—wart susceptible.

SECTIONAL NOTES

MAINE

Maine potatoes are moving to market regularly with a good average daily shipment. On the basis of shipments to December 20th, allowing for 5% increase over those of a year ago, reported in the final figures released December 19th by the U. S. D. A., Maine had apparently moved better than 30% of their carlot shipments. At the same time last year slightly less than 25% of the total of the year had moved to market. With the short crop existing all over the country there is every reason to look for steadily improving prices for Maine potatoes during the balance of the season.

Growers and shippers are bearing in mind, however, that sharp advances cannot be expected for some time to come. They seem ready to move on the market a certain amount each day. By gradually advancing the quotations there has been real constructive improvement evidenced the last three weeks. This will probably be the future policy, namely, to advance slowly but consolidate all gains made. The quality seems to be excellent but due to the adverse weather conditions and the unusual growing period, potatoes have had more of a tendency to bruise and have bruised more than usual. Most shippers report greater shrink.

Activity in consumer packages has been taking a queer turn. Several shippers with excellent reputations for quality packages report great difficulty in moving potatoes in that manner on a profitable basis. Two of the largest shipping organizations, however, report as much or more business than ever before. Just what it means in terms of future trends is hard to determine. The marked increase in price over that existing a year ago has unsettled the entire package trade. There is every indication that with the turn of the year more business will be available in this sort of container.

There has been good activity in seed all the season. The deal during the early fall was very active and considerable volume of sales was made. Recession of price set in, following the trend in table stock, but recently it has improved. There is an apparent unwillingness on the part of both buyers and producers to move any volume until the planting time approaches. There is strong indication of active trading in January. There is no doubt in the minds of reliably informed shippers that all the available supply of both selected and certified seed will be sold. While the volume of seed available has increased over that existing last year, with the increase in acreage forecasted in Government reports, the increase in tonnage will be more than taken care of by the increase in acreage. We hope, however, for the sake of the potato producers everywhere that this increase will not come about.

It is too early yet to determine what will happen to Maine's acreage. There will be a very strong effort made on the part of public and private groups to keep the acreage down to at least that of this last season.—FRANK W. HUSSEY.

KENTUCKY

With yields of over 240 bushels in some cases, 1933 was one of the best late potato years in Kentucky since 1921. The yield for the state averaged well over 160 bushels per acre. Due to the long growing

season some of the tubers are much larger than the ten ounce maximum permitted in the certified seed grade and consequently will have to be graded out. Despite the unusually large tubers there is very little hollow heart. On the whole the certified seed produced in the state this year is of excellent quality.—J. S. GARDNER.

COLORADO

The Colorado potato crop in 1933 exceeded all expectations. A severe drought during mid-season reduced the outlook to about 50 per cent of a crop. In September, however, the weather turned cool with a few showers. Frosts held off too long to obtain maximum quality in the crop but yields were materially benefited by the lengthening of the growing season. In the San Luis Valley where September prospects were for maximum yields of 300 bushels, yields as high as 600 bushels per acre were obtained on some farms.—C. H. METZGER.

HAYTI

Experiments with the Irish Cobbler, Green Mountain and Spaulding No. 4 varieties were destroyed as the result of an outbreak of late blight. Approximately 90 per cent of the tubers decayed. Results of experiments with Dutch varieties have likewise been very discouraging due to the fact that the plants were practically killed by rugose mosaic and leaf roll. In this connection it is of interest to note that seed potatoes secured from Maine showed less than 0.5 per cent virus infection. The chief problems of potato production on a commercial scale in Hayti are (1) prevention of late blight rot of the tubers, (2) maintaining dormancy in potato tubers at temperatures of approximately 22° and a relative humidity of 92 to 95, (3) discoloration of the skin due to the high iron content of the soils in the high altitudes and (4) transportation of the potatoes to consuming centers by mule back. Despite these difficulties we believe potato growing to be profitable in Hayti since the normal retailing price is approximately 6 cents a pound.—LOUIS DEJOIE, Chief, Coffee Experiment Station.

REPORT OF THE 20th ANNUAL MEETING OF THE POTATO ASSOCIATION OF AMERICA

The twentieth annual meeting of the Potato Association of America was held at Boston from December 28th to December 30th, 1933. Two joint sessions were held, one with the American Society of Agronomy and the other with the American Phytopathological Society. A number of interesting papers were presented and the meetings were better attended than has been the case for several years. It is of particular interest to note that twelve potato growers from Maine were in attendance.

OFFICERS

The following officers were chosen:

PRESIDENT—JOHN R. TUCKER, Central Experimental Farms, Ottawa, Canada.
VICE-PRESIDENT—JOHN B. R. DICKEY, Agricultural Experiment Sta., State College, Penn.
SECRETARY-TREASURER—WM. H. MARTIN, Agricultural Experiment Station, New Brunswick, N. J.
EXECUTIVE COMMITTEE—J. R. LIVERMORE, Agr. Exp. Sta., Ithaca, N. Y.
E. M. GILLIG, Dept. of Agr., Fargo, N. D.

The following temporary committees were appointed to serve throughout the meetings:

AUDITING COMMITTEE—FRED H. BATEMAN; C. E. DIMON.
NOMINATING COMMITTEE—E. V. HARDENBURG; JOHN S. GARDNER; H. O. WERNER.
RESOLUTION COMMITTEE—WM. STUART; H. R. TALMADGE; E. M. GILLIG.

REPORT OF THE SECRETARY-TREASURER 1933

The Potato Association of America now has 504 members as compared with 322 in 1932. The membership by states in 1933 was as follows:

California	10	Nebraska	4
Colorado	15	Nevada	1
Connecticut	10	New Hampshire	2
Delaware	4	New Jersey	11
District of Columbia	6	New York	131
Dominion of Canada	31	North Carolina	2
Florida	3	North Dakota	9
Foreign	27	Ohio	32
Idaho	2	Oregon	3
Illinois	3	Pennsylvania	39
Indiana	9	Rhode Island	2
Iowa	4	South Dakota	38
Kansas	1	Tennessee	1
Kentucky	5	Texas	1
Louisiana	1	Utah	3
Maine	21	Vermont	7
Massachusetts	6	Virginia	3
Maryland	7	Washington	9
Michigan	12	West Virginia	6
Minnesota	9	Wisconsin	7
Montana	5	Wyoming	1
Missouri	1		

The tenth volume of THE AMERICAN POTATO JOURNAL comprises 259 pages of printed matter and 62.5 pages of advertising as compared with 199.5 pages of printed matter and 56.5 of advertising in 1932. In 1933 we attempted to publish articles each month that should be of interest to both the investigator and the progressive potato grower. This is difficult but we believe that it can be done and we likewise believe that there is a place for a JOURNAL of this kind. We do not feel that the JOURNAL should be given over to the publication of popular articles entirely since there are so many places where these now appear. We believe that the sectional notes should be of interest to investigator and grower alike and it is hoped that those in charge of the potato work in the different states will send in notes on the crop from time to time. These notes should of course include, whenever possible, any new developments in the potato industry. We plan to broaden the scope of the sectional notes to include statements from foreign countries.

It was necessary to return several manuscripts this past year. The author should understand that this was done only with the approval of the Editorial Committee consisting of F. M. Blodgett, J. R. Livermore and E. V. Hardenburg.

STATEMENT OF ACCOUNTS FEB. 1 TO DEC. 20, 1933.

Receipts

Balance from 1932 (Not yet received due to bank closure)	$264.78	
Annual Dues	691.78	
Sale of Advertising Space	1,041.76	
Miscellaneous	8.60	
Total Receipts		$1,742.14

Expenditures

Printing and Mailing Journal (Feb. to Nov. inclusive)	$948.30	
Other Printing	35.53	
Secretarial Work	340.00	
Stenographic Services	172.90	
Stamps and Stationery	184.20	
Total Expenditures		$1,711.02
Balance as Shown by Bank Statement Attached		$31.12

Accounts Receivable

Sale of Advertising	50.00
Membership Fees (billed)	25.00

WM. H. MARTIN, *Sec'y.-Treasurer.*

AUDITING COMMITTEE

We, the undersigned auditing committee, have examined the books of the Potato Association of America. The books were found in good order.

FRED H. BATEMAN,
C. E. DIMON.

RESOLUTIONS COMMITTEE

This committee brought in the following report, which was adopted by the Association.

RESOLVED: That the thanks of the Association be extended to those responsible for the arrangement of the program for this meeting which has proven of such interest to those present.

RESOLVED: That we the members of the Potato Association of America do hereby express our deep appreciation of the services rendered the Association by Dr. Martin in so ably editing and conducting the publication of the AMERICAN POTATO JOURNAL as well as for increasing the membership of our organization during the past year.

RESOLVED: That the Association express its appreciation to the local committee of the American Association for the Advancement of Science and to Harvard University for the excellent facilities furnished for the meeting of the Association.

RESOLVED: That renewed efforts be made to effect such a degree of uniformity in seed potato certification as may permit of acceptable grade standards thereby enabling Federal recognition of said grades, and that a committee be appointed to work toward that end.

RESOLVED: That Congress be requested through its agricultural committee to provide more adequate federal funds for potato breeding activities thereby permitting of a more thorough and systematic attempt to produce commercially desirable disease resistant varieties of potatoes and be it further resolved that copies of this resolution be sent to the Chairmen of both the Senate and House Agricultural Committees and to the Secretary of Agriculture.

On the outside cover page of the December issue the article by K. H. Fernow was listed as "A Partially Marked Mosaic of Potatoes." This should have read, "A Partially Masked Mosaic of Potatoes."

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American Potato Journal

PUBLISHED BY
THE POTATO ASSOCIATION OF AMERICA
SOMERVILLE, N. J. NEW BRUNSWICK, N. J.

OFFICERS AND EXECUTIVE COMMITTEE

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E. M. GILLIG.....Department of Agriculture, Fargo, N. D.

CONTROLLING ACREAGE

In past years, any suggestion that the potato acreage be reduced was usually followed by an increased planting. If this is done in 1934 the entire potato industry will suffer. The growers were not entirely responsible for the increases since in some instances various credit agencies urged them to plant on a share basis and in this way the total acreage was greatly increased.

There is no question but that the credit agencies could do much to prevent large increases in the acreage planted this year. It is interesting to note that this is being attempted in some sections. Recently, approximately ninety per cent of the dealers in North Carolina and the Norfolk, Virginia, sections signed one or the other of the following two agreements.

"I hereby agree not to finance, on any basis, white potatoes with any grower in North Carolina, the Norfolk section, or the Western Shore of Virginia, who did not plant in 1933 and further agree not to let any growers planting with me increase their acreage over that planted by them in 1933. I shall recommend to cash growers that they do not increase their acreage in 1934 and shall discourage new growers who can finance their production from planting in 1934."

"I hereby agree not to finance in any way, more bags of seed Irish potatoes in 1934 than the number of bags indicated opposite my name."

More recently a majority of the credit agencies on the Eastern Shore of Virginia and Maryland agree to base each grower's total credit allotment on the 1933 acreage or the 1932 acreage, if no potatoes were grown in 1933.

This is a step in the right direction and should help to prevent excessive over-planting. Credit agencies in other sections can well afford to give a similar plan their serious consideration.